

R E M A R K S

Claims 1 through 45 are pending in this application.

By the foregoing Amendment, claims 1 through 4, 6 through 9, 11, 12, 14, 15, 22 through 26, 28, 29, 37 and 38 are amended.

Withdrawn claims 5, 10, 13, 16 through 21, 27, 30 through 36 are amended so as to place them in improved condition for prosecution in a continued prosecution application.

Claims 39 through 45 are withdrawn without prejudice or disclaimer. Please note that these claims were not mentioned or discussed in the Office Action.

Claims 1 through 4, 6 through 9, 11, 12, 14, 15, 22 through 26, 28, 29, 37 and 38 have been amended to provide uniform terminology and additional distinction over the prior art. These changes are believed not to introduce new matter, and entry of the Amendment is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections, and withdraw them.

THE SUBJECT INVENTION

The preferred embodiment of the present invention is directed to laminated structural panels for use as both interior and exterior wall components. The laminated panels include an aluminum honeycomb core panel sandwiched between inner and outer non-metal interlay skins each formed of resin impregnated fiberglass cloth and adhesively secured to the honeycomb core panel. A planar glass panel is supported in a manner which avoids internal temperature change created stress by being adhesively secured to an outer surface of the outer non-metal interlay skin.

PRIOR ART

Lay *et al.* U.S. Patent No. 5,598,674 discloses a composite panel 100 employing a glass pane 101 which is bonded to the outer surface of front aluminum panel 110 by PVC layer 120. The inner surface of front aluminum panel 110 is bonded to a solid lightweight polyethylene core 115. A second, or rear, aluminum panel 105 is similarly bonded to the rear side of the lightweight polyethylene core 115. Aluminum panels 105 and 110 and lightweight polyethylene core 115 constitute a supporting panel 102.

Two fabrication procedures are disclosed in Lay *et al.* with both procedures having inherent shortcomings. More specifically, the first procedure begins with the formation of supporting panel 102 by sandwiching polyethylene core 115 between the rear aluminum panel 105 and the front aluminum panel 110. Bonding of glass pane 101 to front aluminum panel 110 is then effected by use of PVC laminate 120 by a procedure involving sufficient heat generation to create thermal expansion of aluminum panel 110 and glass panel 101. Since aluminum has a higher coefficient of thermal expansion than that of glass, aluminum panel 110 will expand more than glass panel 101 to create possible damaging internal stress in the composite panel.

The second procedure initially bonds the front aluminum panel 110 to the glass pane 101 at an elevated temperature, following which, using PVC laminate 120, it is necessary that the PVC laminate 120 be permitted to cool to permit the lightweight polyethylene core 115 and rear aluminum panel 105 to be mounted on front aluminum panel 110, in a manner not discussed, to complete fabrication of the composite panel 100. Thus, the entire fabrication procedure is inefficient and requires a substantial amount of energy and time.

An additional problem for the composite panel of Lay *et al.* when installed in locations with wide ranges of temperature variation arises from the fact that the coefficient of thermal expansion of aluminum is 0.00001244 per unit length per degree Fahrenheit while the coefficient of thermal expansion of glass is 0.000004 per unit length per degree Fahrenheit. Therefore the amount of thermal expansion of aluminum is approximately three times that of glass and the significance of the differences in thermal expansion are demonstrated by the fact that a one hundred inch long panel of aluminum will expand 0.1244 inches in length in response to a one hundred degree Fahrenheit increase in temperature whereas a one hundred inch long glass panel would only increase 0.04 inches and a granite panel would increase only 0.044 inches which is essentially the same increase as that of glass . Consequently, substantial stress between the front aluminum panel and the glass panel of Lay *et al.* will be created if there is a substantial temperature change which could result in separation of the glass pane 101 and/or the front aluminum panel 110 from the PVC laminate or possible fracturing of the glass. In locations such as Dallas, Texas, the temperature range of building panels of dark colored material can be from 0 to 220 degrees Fahrenheit when in direct sunlight on a 110 degree Fahrenheit day, so that the thermal expansion would be more than double than that resultant from a 100 degree Fahrenheit temperature change so as to almost certainly cause grave damage to the Lay *et al.* panel. A significant advantage of the present invention over Lay *et al.* is that it is not subjected to such thermal stress damage to a glass panel or even when granite is employed as discussed in the first paragraph of page 18 of the application due to the fact that the coefficient of thermal expansion of granite is

0.0000044 which is essentially the same as that of glass (0.000004). Thus, granite and glass panels can both be interchangeably used in the subject invention.

The Kourtides *et al.* U.S. Patent No. 4,598,007 is in the unique field of aircraft panels which is far removed from the building wall structural component field of the present invention and the Lay *et al.* patent. More specifically, Kourtides *et al.* is directed to a lightweight fire resistant graphite composite made especially for aircraft panels, and is not at all concerned with mounting of glass panels in a manner to withstand high impact, wind loads, flexure and large temperature variations, all of which are achieved by the subject invention. Kourtides *et al.* preferably employs an expansive vinyl styrylpyridine-vismaleimide copolymer and a “polyamide” paper core which would not be practical for building components. Kourtides *et al.* also preferably employs carbon fibre reinforcement which is typical in aircraft construction but which is over 100 times the cost of glass fiber reinforcement. The Kourtides *et al.* structure is consequently impractical structurally and too expensive for large structure building facades whether used either for the interior or exterior of buildings. The high cost and complex chemistry involved in the Kourtides *et al.* structure would inherently preclude consideration thereof for use in building structural panels such as those of both the present invention and the Lay *et al.* reference. It is also noted that Kourtides *et al.* does not disclose or suggest the possibility or desirability of incorporation of any aspect of its disclosed invention either in the building structure field or in conjunction with providing support for glass panels.

The Mauthe U.S. Patent No. 4,391,662 is solely directed to a method and means for providing an effective thermal plastic adhesive connection or seal using thermachrome dye. The paragraph beginning in column 4, line 17 of this patent lists a number of thermal plastic adhesives including ethylvinylacetates which may be used in practice of the methods disclosed in the patent. There is no disclosure, suggestion or teaching with respect to possible uses of ethylvinylacetates in building structures or the like. Thus, the Mauthe patent discloses nothing more than the mere existence of ethylvinylacetates and does not suggest or make obvious the use of such in building structural panels such as those of Lay *et al.* and the present invention.

REJECTION UNDER 35 U.S.C. § 103

The rejection of claims 1 through 4, 6 through 9, 22 through 26, 28, 29 and 37 through 38 under 35 U.S.C. § 103(a) as being unpatentable over Lay *et al.* in view of Kourtides *et al.* is respectfully, but forcefully, traversed. The rejection contends that it would have been obvious to one of ordinary skill in the art to replace polyethylene core 115 of Lay *et al.* with honeycomb core 11 of Kourtides *et al.* to provide lightweight and improved fire resistance.

In order for a prima facie case of obviousness to be established, the applied prior art must be such that it would have provided one of ordinary skill in the art with both a motivation to carry out the claimed invention and a reasonable expectation of success in doing so. See In re Vaeck, 947 F. 2nd 488, 493, 20 USPO 2ND 1438, 1442 (Fed. Cir. 1991); In re O'Farrell 853 F. 2nd 894, 902 7 USPO 2nd 1673, 1680 (Fed. Cir. 1988). In the present case, Kourtides *et al.* does not teach either motivation for the Lay *et al.* proposed modifications or a reasonable expectation of success of such for the particular proposed modification of Lay *et al.*

Firstly, Kourtides *et al.* is not directed to structure for supporting heavy glass panel building components but is in the non-analogous lightweight structural aircraft panel art not having the same problems as building structures while requiring expensive materials and procedures which would preclude their consideration for use by a person of skill in the heavyweight art of building structural panels exemplified by Lay *et al.* Such a non-analogous art consequently cannot properly be employed to suggest the modifications of Lay *et al.* that would be necessary to provide a hypothetical structure corresponding to the structures recited in the rejected claims.

Secondly, even if Kourtides *et al.* is deemed to be in an analogous art, it does not teach the modification of Lay *et al.* that would be necessary to create a hypothetical structure corresponding to the claimed structure. More specifically, there is no disclosure of glass panels in Kourtides *et al.* Moreover, there is no suggestion that the structure disclosed therein or parts thereof could be used for supporting glass panels that are substantially heavier than aircraft panels. The incorporation of the honeycomb core 11 of Kourtides *et al.* would not result in improved fire resistance and is not warranted and is simply speculation that is neither taught or suggested by Kourtides *et al.* In fact, Lay's aluminum panels 105 and 110 would obviously provide a high degree of fire resistance that would not be enhanced by use of Kourtides *et al.* honeycomb core 11 in Lay *et al.* It is also pointed out that Kourtides *et al.* preferred honeycomb embodiment is formed of aromatic polyamide paper and the use of such in place of the polyethylene core 115 of Lay *et al.* might well reduce the strength of the Lay *et al.* structure.

Claim 1 distinguishes over Lay *et al.* in reciting a composite building wall structural panel including a planar glass panel having an inner surface and a honeycomb core panel having an outer honeycomb face surface and a non-metal interlay skin having an inner skin surface and an outer skin surface with the inner skin surface of the outer non-metal interlay skin being adhesively secured to the honeycomb face surface and the outer skin surface of the outer non-metal interlay skin being adhesively secured to the inner surface of the planar glass panel. The glass panel 101 of Lay *et al.* is bonded by PVC layer 120 to metal aluminum panel 110 and not to a honeycomb core panel of any type. Thus, the aluminum panel 110 is not a "non-metal interlay skin" as recited in claim 1. Additional distinction of claim 1 is provided by the recital of a desired visual effect

such as color and/or design provided to the adhesive interlay so as to be visible through the glass panel. In *Lay et al.* the design or the like is provided to the outer surface 111 of front aluminum panel 110, not to an adhesive interlay, as indicated in the paragraph beginning in column 3, line 3 of *Lay et al.*

The aforementioned shortcomings of *Lay et al.* are not correctable by the teachings of the irrelevant *Kourtides et al.* patent as previously noted in that a person of skill in the building structural panel art of *Lay et al.* would not seek solutions to problems or improvements in the non-analogous aircraft panel field of *Kourtides et al.* It is additionally pointed out that even if *Kourtides et al.* was in an analogous field of endeavor, it does not provide any teachings of achieving a desired visual effect such as color and/or design provided on an adhesive interlayer to be visible through a glass panel as recited in claim 1.

Therefore, it is respectfully, but forcefully, urged that claim 1 should be allowed.

Claim 2 depends from claim 1 and should be allowed for the same reasons noted above with respect to claim 1. Additionally, claim 2 further distinguishes over *Lay et al.* and other prior art in specifying that “the outer non-metal interlay skin is formed of resin impregnated fiberglass cloth”.

Claim 3 depends from claim 2 and should be allowed for the same reasons as claim 2 as noted above. Additionally, claim 3 further distinguishes over the prior art in additionally reciting an “inner non-metal interlay skin bonded to the inner honeycomb space surface of the honeycomb core panel”.

Claim 4 depends from claim 3 and should be deemed allowed for the same reasons as claim 3. In addition, claim 4 additionally includes the further limitation that

“the inner non-metal interlay skin is formed of resin impregnated fiberglass cloth” to provide a further distinction over the prior art.

Withdrawn Claim 5 depends from and is covered by generic claim 1 and should be allowed for the same reasons as claim 1. Claim 5 additionally distinguishes over the prior art in providing that “the visual effect is provided by printing on the adhesive interlayer”.

Claim 6 depends from claim 1 and should be allowed for the same reasons as claim 1 as discussed above. In addition, claim 6 further provides that “the visual effect is provided by an image providing sheet bearing a visible design positioned between, and adhesively secured to, the outer skin surface of the outer non-metal interlay skin and the inner surface of the planar glass panel” so as to further distinguish over the prior art.

Claim 7 depends from claim 1 and should be allowed for the same reasons as claim 1 as noted above. Additionally, claim 7 further distinguishes over the prior art in reciting that “the visual effect is provided by an image providing vinyl sheet bearing a design and positioned between, and adhesively secured to, the outer skin surface of the outer non-metal interlay skin and the inner surface of the planar glass panel”.

Claim 8 depends from claim 1 and should be allowed for the same reasons as claim 1. Additionally, claim 8 further distinguishes over the prior art in reciting that “the outer non-metal interlay skin is formed of resin impregnated fiberglass cloth and the visual effect is provided by an image providing sheet bearing a visible design and positioned between, and adhesively secured to, the outer skin surface of the outer non-metal interlay skin and the inner surface of the planar glass panel”.

Claim 9 depends from claim 1 and should be allowed for the same reasons as claim 1. Further distinction over the prior art is provided by claim 9 by the additionally added “an inner non-metal interlay skin adhesively secured to the inner honeycomb face surface, wherein the inner non-metal interlay skin is formed of resin impregnated fiberglass cloth and the desired visual effect is provided by an image providing sheet bearing a visible design and positioned between, and adhesively secured to, the outer skin surface of the outer non-metal interlay skin and the inner surface of the planar glass panel”.

Claims 11, 12, 14 and 15 depend either directly or indirectly from claim 1 and were rejected under 35 U.S.C. 103(a) as being unpatentable over Lay *et al.* and Kourtides *et al.* as applied to claims 1 through 4 and 6 through 9, in view of Mauthe U.S. Patent No. 3,391,662. Thus rejection is respectfully traversed in that Lay *et al.* and Kourtides *et al.* do not provide teachings resulting in anticipation of parent claim 1 for the reasons noted above. Mauthe obviously does not overcome the shortcomings of Lay *et al.* and Kourtides *et al.* Since, claims 11, 12, 14 and 15 depend either directly or indirectly from claim 1, they should be allowed. Moreover, the fact that Mauthe discloses nothing more than the mere existence of ethylvinylacetate (EVA) prevents it from suggesting the use of ethylvinylacetate in the novel structure of claim 16.

Claim 12 depends from claim 11 and should be allowed for the same reasons as claim 11. Additionally, claim 12 further distinguishes over the prior art in providing that “the outer non-metal interlay skin is formed of resin impregnated fiberglass cloth”.

Claim 14 depends from claim 11 and should be allowed for the same reasons as claim 11 as discussed above. Additionally, claim 14 further distinguishes over the prior art in reciting “the desired visual effect is provided by an image providing sheet bearing a visible design and positioned between, and adhesively secured to, the outer skin surface of the outer non-metal interlay skin and the inner surface of the planar glass panel”.

Claim 15 depends from claim 11 and should be allowed for the same reasons as claim 11 as discussed above. Additionally, claim 15 provides further distinction over the prior art in reciting that “the desired visual effect is provided by an image providing vinyl sheet bearing a visible design and positioned between, and adhesively secured to, the outer skin surface of the outer non-metal interlay skin and the inner surface of the planar glass panel”.

Claim 22 depends from claim 1 and should be allowed for the same reasons as claim 1. Moreover, claim 22 further distinguishes over the prior art in specifying that “the adhesive interlayer is colored so as to be visible through the glass panel”.

Claim 23 depends from claim 1 and should be allowed for the same reasons as claim 1. Additional distinction over the prior art is provided by the recitation that “the honeycomb core is primarily formed of aluminum”.

Claim 24 depends from claim 23 and should be allowed for the same reasons as claim 23. Additionally, claim 24 has the further distinction over the prior art by indicating “the outer non-metal interlay skin is formed of resin impregnated fiberglass cloth”.

Claim 25 depends from claim 24 and should be allowed for the same reasons as claim 24. Claim 25 provides further distinction over the prior art by additionally including “an inner non-metal interlay skin adhesively secured to the inner honeycomb face surface of the honeycomb core panel”.

Claim 26 depends from claim 25 and should be deemed allowed for the same reasons as claim 25. Additionally, claim 26 further distinguishes over the prior art in specifying “the inner non-metal interlay skin is formed of resin impregnated fiberglass cloth”.

Claim 28 depends from claim 23 and should be allowed for the same reasons as claim 23.

Claim 29 depends from claim 23 and should be deemed allowed for the same reasons as claim 23. In addition, claim 29 provides a further distinction over the prior art in specifying “the desired visual effect is provided by an image providing vinyl sheet bearing a design and positioned between, and adhesively secured to, the outer skin surface of the outer non-metal interlay skin and the inner surface of the planar glass panel”.

Claim 37 was rejected as being unpatentable over Lay *et al.* in view of Kourtides *et al.* for the same reasons as claim 1. This rejection is respectfully, but forcefully, traversed for the same reasons as claim 1 in that the applied references do not suggest the modification of Lay *et al.* to incorporate a honeycomb core. Moreover, claim 37 additionally distinguishes over Lay *et al.* and Kourtides *et al.* in reciting “an interlayer formed of vinyl which has an inner surface and an outer surface, the inner surface of the interlayer being adhesively secured to the outer honeycomb face surface of the

honeycomb core panel and the outer surface of the interlayer being adhesively secured to the inner surface of the planar glass panel by an adhesive film layer to securely retain the glass panel to the honeycomb core panel and wherein a desired visual effect is provided by the interlayer so as to be visible through the glass panel”. The prior art does not suggest the foregoing construction and claim 37 should be allowed.

Claim 38 is similar to claim 37 in all respects except for indicating that the interlayer is formed of film rather than vinyl as recited in claim 37. Therefore, the above comments with respect to claim 37 are equally applicable to claim 38, which should be allowed.

CONCLUSION

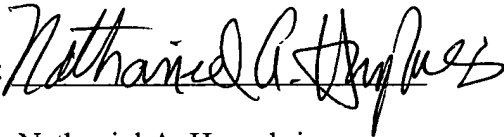
Therefore, it is respectfully submitted that all of the previously rejected claims and claim 5 should be allowed.

There being no outstanding formal matters, passage to issue is urged to be in order and is respectfully solicited.

Respectfully submitted,

JACOBSON HOLMAN PLLC

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By: 

Customer No. 00,136
Jacobson Holman, PLLC
400 Seventh Street, N.W.
Washington, D.C. 20004
(202) 638-6666

Nathaniel A. Humphries
Registration No. 22,772

Attorney Docket: P68694US0